

ABSTRACT

In fabricating a shallow trench isolation (STI), a silicon oxide layer, a silicon nitride layer and a moat pattern is sequentially deposited on a silicon substrate. Next, the silicon nitride layer and the silicon oxide layer is etched using the moat pattern as a mask to thereby partially expose the silicon substrate and then the moat pattern is removed. Ion implanting process is performed into the silicon substrate using the silicon nitride layer as a mask, adjusting a dose of an implanted ion and an implant energy, to thereby form an isolation region. And then, the isolation region to form a porous silicon and to form an air gap in the porous silicon is anodized, wherein a porosity of the porous silicon is determined by the dose of the implanted ion. Next, the porous silicon is oxidized through an oxidation process. Finally, the silicon nitride layer is removed.